

North Dakota State Water Commission

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MEMORANDUM

TO: Lee Klapprodt, Director, Planning and Education Division

FROM: Michael Noone, Planner III

SUBJECT: Devils Lake Biota Transfer Risk Analysis

DATE: September 4, 2002

Biota transfer from the Devils Lake sub-basin to the Hudson Bay basin is one of the major concerns that those opposed of both the Federal and State emergency outlets have raised. As a result of the concern regarding the Devils Lake emergency outlets, the Garrison Diversion Project, and the NAWS project in the past, there have been a multitude of studies conducted exploring the potential for biota transfer.

There have been a number of studies on biota transfer, commissioned by both State and Federal agencies over the years.

TITLE: International Garrison Diversion Study Board: Appendix C, Biology Report

COMPLETED: 1976

AUTHOR: International Garrison Diversion Study Board

FINDINGS: Alteration of habitat in North Dakota will result in average annual loss of 35,500 waterfowl in Manitoba. Substantial reductions in Lake Winnipeg commercial and sports fish are predicted as a result of the Garrison Diversion Unit causing transfer of foreign fish species into Canadian waters.

LIMITATIONS: Biotic inventory data gap, especially organisms such as pathogens, parasites. Did not study entire Hudson Bay basin.

TITLE: Garrison Diversion Unit-Final Comprehensive Supplementary Environmental Statement: Volume 1

COMPLETED: 1979

AUTHOR: Department of the Interior

FINDINGS: Essentially a study cataloguing species of concern. Also found that likelihood of all "worst-case scenario" impacts of occurring was highly unlikely.

LIMITATIONS: Biotic inventory data gap, especially organisms such as pathogens, parasites. Did not study entire Hudson Bay basin.

TITLE: Garrison Diversion Unit Commission: Final Report to the Secretary of the Interior, Senate Committee on Energy and Natural Resources, Senate Committee on Appropriations, House Committee on Interior and Insular Affairs, House Committee on Appropriations

COMPLETED: 1984

AUTHOR: Garrison Diversion Unit Commission

FINDINGS: Recommended a one-time baseline survey of species and pathogens in waters of the Hudson Bay drainage, utilizing an independent international organization not affiliated with the Governments of the United States or Canada.

LIMITATIONS: Acknowledged biota data gap in the Hudson Bay basin.

TITLE: Biology Task Force Report

COMPLETED: 1990

AUTHOR: Garrison Joint Technical Committee

FINDINGS: Essentially a study cataloguing species of concern. Did conclude that the chosen design would have far less likelihood of biota transfer, than would the "bait-bucket effect."

LIMITATIONS: Acknowledged a biotic inventory data gap, especially organisms such as pathogens, parasites. Did not study entire Hudson Bay basin.

TITLE: Pathways for Aquatic Biota Transfer Between Watersheds

COMPLETED: 1995

AUTHOR: North Dakota Water Resources Institute, NDSU, and UND

FINDINGS: The movement of aquatic organisms across watershed boundaries is almost inevitable over time, via various biophysical and anthropogenic vectors.

LIMITATIONS: Acknowledged a biotic inventory data gap. Did not study entire Hudson Bay basin.

TITLE: Preliminary Assessment of the Environmental Effects with International Implications of a Transfer of Water from Devils Lake to the Hudson Bay Drainage

COMPLETED: Completed in 1997, but not formally released until later date

AUTHOR: Devils Lake Working Group Report for the Garrison Joint Technical Committee

FINDINGS:

Fish: Only three species were introduced or occur in Devils Lake, that were not found as of the completion of the report in Lake Winnipeg; striped bass, muskellunge, and the tiger muskie. Of those three, intensive netting has resulted in no striped bass captured, other than the last caught by an angler in 1993, the muskellunge has been stocked unsuccessfully in Manitoba, and the tiger muskie is found in the Red River drainage.

Algae: A literature review of algae found in Devils Lake was compared to a similar list for Lake Winnipeg. The conclusion was that threat of exotic algal introduction was unlikely.

Aquatic Macrophytes: Concluded that there were no species in Devils Lake not already found in Canada, or in the Sheyenne drainage below Baldhill Dam.

Pathogens: Concluded that fish stocking of Hudson Bay drainages in North Dakota over the past 50 years, made it likely that this would already have occurred, given the common sources from hatcheries.

Invertebrates: Literature review concluded that given the known range of aquatic invertebrates, and the aerially mobility of the adult stages of some insects, that species distribution should be the same for both drainages.

LIMITATIONS: Acknowledged a biotic inventory data gap, especially organisms such as pathogens, parasites, algae, and aquatic vascular plants. Did not study entire Hudson Bay basin.

TITLE: Science and Policy: Interbasin Water Transfer of Aquatic Biota

COMPLETED: 2001

AUTHOR: Leitch, J.A., and M.J. Tenamoc

FINDINGS: A comprehensive literature review that found that there are multiple vectors available for biota transfer, from bait buckets, to floods, to aquarium releases, and others. The likelihood of biota transfer via interbasin transfer of water can be reduced to nearly zero, utilizing chemical; treatment, while the likelihood of biota transfer via other means approaches near certainty. Reducing the likelihood of these other means occurring is much more difficult.

LIMITATIONS: This study was quite thorough, but similar to previous studies, commented on the data gaps in biota data inventory gap. Did not study entire Hudson Bay basin.

TITLE: Biota Transfer Study-Devils Lake Flood Damage Reduction Alternatives

COMPLETED: 2002

AUTHOR: Peterson Environmental Consulting, Inc., for the USACE

FINDINGS: Based upon all available information, it appeared highly unlikely that downstream habitats (ie the Hudson Bay basin), would suffer substantially as a result of biota transfer caused by the Devils Lake outlet project.

LIMITATIONS: Acknowledged a biotic inventory data gap, especially organisms such as pathogens, parasites, algae, and aquatic vascular plants. Did not study entire Hudson Bay basin.

TITLE: Survey of Specific Fish Pathogens in Free-ranging Fish from Devils Lake and the Sheyenne and Red Rivers in North Dakota: Progress Report

COMPLETED: 2002

AUTHOR: Peters, K.K., United States Fish and Wildlife Service, Bozeman, Montana

FINDINGS: None of the 180 fish collected (4 species, black crappie, northern pike, walleye, and yellow perch) and examined from Devils Lake, regardless of species or size, had any external or internal clinical signs of disease. All fish appeared healthy and in good general condition. The only disease-related factor detected, was a barely

measurable amount of the soluble antigen of *Renibacterium salmoninarum*, but the disease itself was not detected.

LIMITATIONS: Study did not have a large sample-set, and also did not sample every known fish species in Devils Lake.

One additional study about Devils Lake biota, the **Draft Macroinvertebrate Sampling Report-Devils Lake Study**, prepared a by EarthTech Inc. for the USACE in 2002, was conducted for the dual purposes of providing potential biological indicators for monitoring changes as result of the Devils Lake emergency outlet, and additionally providing a more thorough species list of macroinvertebrates in Devils Lake and the Sheyenne River, thus answering some of the limitations of other biota transfer risk analysis studies. On the Canadian side of the border, Manitoba Conservation, Fisheries Division is currently conducting a limnological and biotic analysis of Lake Winnipeg, with periodic sampling of the lake to be conducted for the foreseeable future.

In addition to a great number of studies, there have also been significant costs associated with conducting those studies. Dr. Jay Leitch, Dean of the College of Business Administration at NDSU, and author of the 2001 literature review cited in this memo, estimated the real dollar cost of the studies associated with the Garrison Diversion at approximately \$1,000,000, with considerable incidental costs, such as in kind contributions by various groups, increasing the grand total to approximately \$1,500,000. Dr. Leitch further stated that there was not much more to be found out, that would further illuminate the issue of biota transfer from the Devils Lake sub-basin.

The NAWS project has also had concerns of biota transfer associated with it, and a statistical analysis of the probabilities of transfer was conducted based upon existing documentation. According to Dr. Rick Nelson, the Chief of Resource Management for the Bureau of Reclamation, Dakota Area Office, the NAWS biota study was much less detailed than the Garrison Diversion study conducted by Dr. Leitch, as it only examined species of concern, and the potential consequences of biotic introduction were not analyzed. As a result the study only cost approximately \$60,000. Dr. Nelson is currently conducting a similar study in the Red River Valley. This study will be more in-depth, including a consequence analysis, resulting in an estimated total cost of \$300,000, and will take over two years to complete.

The issue of the possibility of the transfer of biota from the Devils Lake sub-basin to the Hudson Bay basin has been exhaustively explored by many different entities, and over many years. As a result, the Devils Lake sub-basin may be one of the most extensively and exhaustively studied areas in North America. What these numerous studies, and millions of dollars have concluded, is that Devils Lake not only represents an infinitely small risk of biota introduction to the Hudson Bay basin, a drainage basin to which it belongs, but that the real risk of biota introduction is actually from a multitude of other areas, and these will continue to occur with or without a constructed outlet.

When considering the recommendation made by some, that the State of North Dakota should do a thorough biotic survey of not only the Devils Lake sub-basin, but the Hudson

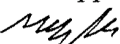
Bay basin as well, it should be noted that this would have very significant costs associated with it. When considering the cost \$1.5 million that Dr. Leitch cited for his study, it should be understood that it was primarily a biotic survey of Devils Lake, the Sheyenne River, the Red River, and Lake Winnipeg. To complete a thorough biotic survey of the Hudson Bay basin, which is hydrologically connected throughout, it would be necessary to sample a good proportion of the basin. Such a goal would entail a detailed study of large parts of North Dakota, Montana, Minnesota, Alberta, Saskatchewan, Manitoba, Quebec, Newfoundland, the Northwest Territories, and the Inuit jurisdiction of Nunavut. The costs entailed in an study of this immense scope and magnitude are not known, but is likely to run in the hundreds of millions if not billions of dollars, and require unprecedented inter-jurisdictional cooperation, and an accumulation of diverse disciplines with the requisite enormous number of support staff.

Unfortunately, even scientific studies such as are currently being advocated by opponents of the Devils Lake emergency outlet, would not definitively rule out the possibility of biota transfer, as science often does not give definitive answers. It is our conclusion that instead of finally putting this issue to rest, further studies into biota transfer may only raise further questions.

Furthering the argument against conducting further biota studies is the case of the Shell Lake outlet. Shell Lake, a closed-basin lake in western Wisconsin, has experienced flooding problems strikingly similar to that of Devils Lake. Above average precipitation in recent years have caused lake levels to rise dramatically, threatening the surrounding communities. As a result, the City of Shell Lake has gotten approval from the Wisconsin Department of Natural Resources to build an artificial outlet with a maximum flow of 20 cfs, in order to alleviate their flooding problems. In stark contrast to the Devils Lake emergency outlet, the Shell Lake outlet was only subjected to an Environmental Assessment (EA), as opposed to the much more rigorous and detailed Environmental Impact Statement (EIS).

An EA was deemed sufficient for the Shoal Lake outlet despite the fact that there have been no in-depth analyses of the potential for biota transfer. Additionally, Minnesota, an opponent of the Devils Lake emergency outlet, has made no visible opposition to the Shell Lake outlet, despite the fact that this project would drain water and biota from a closed-basin lake into the Mississippi River. Inter-basin transfer projects in Minnesota, Manitoba and Ontario, done without the benefit of studies as detailed as those already conducted for Devils Lake, indicates that the potential for biota transfer is not always the most important factor in determining if a project is completed.

This seeming inconsistency on the part of those opposed to the Devils Lake emergency outlet, along with the multitudes of studies already conducted, lends credence to the view that opposition is not based upon scientific information.



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